



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,789	10/27/2003	Thomas L. Toth	GEMS8081.193	2788
27061	7590	02/24/2005	EXAMINER	
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (GEMS)			KAO, CHIH CHENG G	
14135 NORTH CEDARBURG ROAD			ART UNIT	
MEQUON, WI 53097			PAPER NUMBER	
			2882	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/605,789

Applicant(s)

TOTH ET AL.

Examiner

Chih-Cheng Glen Kao

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/16/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities.

In the following format (location of objection; suggestion for correction), the following corrections may obviate their respective objections: (paragraph 27, line 3, "A stator 70"; replacing "70" with - -80- -), (paragraph 33, lines 1-2, "independently position filters 96, 100"; replacing "100" with - -98- -), and (paragraph 37, line 9, "through opening 102"; replacing "102" with - -122- -).

Appropriate correction is required.

### ***Claim Objections***

2. Claim 11 is objected to because of the following informalities, which appear to be minor draft errors including grammatical and lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following corrections may obviate their respective objections: (claim 11, line 1, "A CT system"; replacing "CT" with - -computed tomography (CT)- -) and (claim 11, line 13, "the photodiode outputs"; deleting "the").

For purposes of examination, the claim has been treated as such. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 7, 8, 17, 19, 20, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Moore (US Patent 4181858).

4. Regarding claims 1 and 17, Moore discloses an x-ray beam shaping filter assembly (fig. 1a, #26) comprising: a first moveable filter having a non-uniform thickness (fig. 3a, #26 on left), a second moveable filter which would necessarily be independent (as evidenced by the separate detectors (fig. 3a, #33 on right) and motor (fig. 1a, box to right of #26)) of the first moveable filter and having a non-uniform thickness (fig. 3a, #26 on right); and wherein at least one of the first moveable filter and the second moveable filter is configured to be placed in a high frequency electromagnetic energy beam (col. 4, lines 56-58) for attenuation of the beam for radiographic data acquisition (col. 5, lines 16-19) and at least one motor assembly (fig. 2a, #30) configured to independently position a movable filter (fig. 2a, #26 on right) such that a beam profile is created that substantially conforms to a shape of a subject or target to be scanned (fig. 2a, #15 in relationship to #3, and figs. 4a-5).

5. Regarding claim 2, Moore further discloses wherein the second moveable filter has a shape that mirrors that of the first moveable filter (fig. 1a, #26).

6. Regarding claims 7, 8, and 20, Moore further discloses wherein the first and second moveable filters are each defined by a base (fig. 3a, right section of #26 on right), a tail (fig. 3a, left section of #26 on right), and a curved portion (fig. 3a, middle section of #26 on right) connecting the base to the tail, wherein the base (fig. 3a, right section of #26 on right) has a thickness greater than that of the tail (fig. 3a, left section of #26 on right), and wherein first and second motor assemblies (figs. 1a and 3a, #30) are further configured to position the first and the second filters such that the tail of the first filter is proximate to the tail of the second filter (fig. 3a, #26).

7. Regarding claim 19, Moore further discloses wherein the first and second motor assemblies are further configured to position the first and second filters with respect to one another such that at least a portion of the filters overlaps (fig. 3a, #26).

8. Regarding claim 22, Moore further discloses the filter assembly incorporated into a CT scanning system (abstract, line 1).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore as applied to claim 1 above, and further in view of Popescu (US Patent 6501828).

10. Regarding claim 5, Moore discloses an apparatus as recited above.

However, Moore does not disclose dynamically positioning a moveable filter during data acquisition.

Popescu teaches dynamically positioning a moveable filter (fig. 2) during data acquisition (abstract).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Moore with the dynamic moveable filter of Popescu, since one would be motivated to make such a modification to simplify the generation of high grade x-ray images (col. 2, lines 1-7) as shown by Popescu.

11. Regarding claim 6, Moore further discloses at least one motor assembly (fig. 2a, #30) further configured to dynamically position a moveable filter (fig. 2a, #26), based on a scout scan carried out before CT data acquisition (col. 6, lines 43-45).

12. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore as applied to claim 7 above.

Moore discloses an apparatus as recited above.

However, Moore does not disclose wherein the base has a thickness of 30 mm and the tail has a thickness of 0.25 mm, or wherein the base of the first moveable filter has a length along an

Art Unit: 2882

x-direction of 112 mm; wherein the curved portion of the first moveable filter has a length along the x-direction of 24.9 mm; wherein the tail of the first moveable filter has a length along the x-direction of 135 mm; wherein the base of the second moveable filter has a length along the x-direction of 53 mm; wherein the tail of the second moveable filter has a length along the x-direction of 168 mm; and wherein the curved portion of the second moveable filter has a length along the x-direction of 34.2 mm.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Moore with the above measurements, since such a modification would have only involved a mere change in the size of a component. A change in size is generally recognized as being with the level of ordinary skill in the art. One would be motivated to make such a modification to reduce unnecessary radiation to a patient (col. 5, line 66, to col. 6, line 3) as implied from Moore.

13. Claims 11-16 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore as respectively applied to claim 22 above, and further in view of Hoffman et al. (US Patent 6137857).

14. Regarding claim 11, Moore discloses an apparatus as recited above. Moore further discloses the apparatus in a CT system (abstract, line 1) including a rotatable gantry having an opening (fig. 1a, #1) to receive a subject (fig. 1a, #3) to be scanned, a high frequency electromagnetic energy projection source (fig. 1a, #14), a scintillation system to detect high frequency electromagnetic energy passing through the subject (col. 4, line 68), photodiodes

Art Unit: 2882

optically coupled to the scintillation system to detect light from the scintillation system (col. 5, line 1), a data acquisition system (DAS) connected to the photodiodes and configured to receive photodiode outputs (fig. 1a, #19).

However, Moore does not specifically disclose a scintillator array, a photodiode array, and an image reconstructor coupled to a DAS and configured to reconstruct an image of a subject from photodiode outputs received by the DAS.

Hoffman et al. teaches a scintillator array (col. 2, line 3), a photodiode array (col. 2, lines 2-3), and an image reconstructor (fig. 2, #34) coupled to a DAS (fig. 2, #34) and configured to reconstruct an image of a subject (fig. 2, #22) from photodiode outputs (fig. 2, #20) received by the DAS.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the system of Moore with the arrays and image reconstructor of Hoffman et al., since one would be motivated to make such a modification to increase the amount of information obtained (col. 1, lines 35-36) and to provide a better image (fig. 2, #42) of the internals of a patient (fig. 2, #22) as implied from Hoffman et al.

15. Regarding claims 12, 13, and 23, Moore as modified above suggests a system as recited above. Moore further discloses at least one motor assembly (fig. 2a, #30) further configured to dynamically position a moveable filter (fig. 2a, #26), based on a scout scan carried out before CT data acquisition (col. 6, lines 43-45).

However, Moore does not specifically disclose controls signals transmitted to a controller by a programmed computer.



Art Unit: 2882

Hoffman et al. further discloses control signals transmitted to a controller (fig. 2, #28, 30, or 44) by a programmed computer (fig. 2, #36).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the system of Moore as modified above with computer controls of Hoffman et al., since one would be motivated to make such a modification to make the system more compact with only one computer running the tasks, instead of multiple computers.

16. Regarding claims 14-16, Moore further discloses mirrored filters (fig. 1a, #26), wherein each filter is defined by a base (fig. 3a, right section of #26 on right), a tail (fig. 3a, left section of #26 on right), and a curved portion (fig. 3a, middle section of #26 on right) connecting the base to the tail, and wherein the base blocks more x-rays than that of the tail (fig. 2a, #26 and 26').

17. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moore as applied to claim 17 above, and further in view of Gunji et al. (JP 08-266523).

Moore discloses an apparatus as recited above.

However, Moore does not disclose filters with different contours.

Gunji et al. teaches filters with different contours (fig. 4, #23-1 and 23-2).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Moore with the filters of Gunji et al., since one would be motivated to make such a modification to make filters more suitable for an examinee (abstract, purpose) as implied from Gunji et al.

Art Unit: 2882

18. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moore as applied to claim 17 above, and further in view of Romeas (US Patent 6148062).

Moore discloses an apparatus as recited above.

However, Moore does not disclose a stationary filter such that a non-zero minimum attenuation is provided when first and second filters are not overlapping.

Romeas teaches a stationary filter (fig. 5, #17a) such that a non-zero minimum attenuation is provided (fig. 5, attenuation left of #6) when first and second filters (fig. 5, #18b) are not overlapping.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Moore with the filter positions of Romeas, since one would be motivated to make such a modification to avoid overexposure in some areas of an image (col. 1, lines 8-12) as shown by Romeas.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gk



DAVID V. BRUCE  
PRIMARY EXAMINER